

I claim:

1 1. A heating element for igniting a pyrotechnic charge
2 comprising
3 a base body, a structured strip shaped resistance layer on said
4 base body, and contact fields overlapping said resistance layer
5 at ends thereof for applying a current pulse to the heating
6 element, wherein the heating element has a mass of 1.0×10^{-9} kg to
7 4.0×10^{-9} kg, a specific resistance of $1 \times 10^{-6} \Omega\text{m}$ to $2 \times 10^{-6} \Omega\text{m}$ and a
8 specific heat capacity of 100 W/(kg.K) to 400 W/(kg.K).

1 2. The heating element defined in claim 1 wherein the
2 heating element has a cross sectional area of $3.5 \times 10^{-10} \text{ m}^2$ to
3 $7.0 \times 10^{-10} \text{ m}^2$.

1 3. The heating element defined in claim 1 wherein the
2 resistance layer is composed of a sintered Ag/Pd resistance
3 paste or a sintered Ag/Au/Pd resistance paste containing 30 to
4 50 mass% Ag and 35 to 50 mass % Pd, or a sintered Pt/W
5 resistance paste containing 70 to 90 mass %% Pt and 5 to 20
6 mass% W.

1 4. The heating element defined in claim 1 wherein the
2 base body is composed of a high-temperature-resistant glass or
3 glass-ceramic or ceramic with a thermal conductivity of at most
4 2 W/(m•K).

1 5. The heating element defined in claim 1 wherein
2 the base body is composed of a high-temperature-resistant glass
3 or glass-ceramic or ceramic with a thermal conductivity of at
4 most 3 W/(m•K) and a heat barrier is applied to said base body
5 which is comprised of a glass or glass-ceramic layer of a
6 thickness of 20 to 80 μm and a thermal conductivity of at most
7 1.5 W/(m•K).

1 6. The heating element defined in claim 1 wherein the
2 contact fields are composed of sintered AgPd or AgPt thick-layer
3 conductor paste with Pd or Pt proportions between 1 and 10
4 mass%.

1 7. The heating element defined in claim 1 wherein the
2 heating element has a cross sectional area of $3.5 \times 10^{-10} \text{ m}^2$ to
3 $7.0 \times 10^{-10} \text{ m}^2$, the resistance layer is composed of a sintered
4 Ag/Pd resistance paste or a sintered Ag/Au/Pd resistance paste

5 containing 30 to 50 mass% Ag and 35 to 50 mass % Pd, or a
6 sintered Pt/W resistance paste containing 70 to 90 mass %% Pt
7 and 5 to 20 mass% W, the base body is composed of a high-
8 temperature-resistant glass or glass-ceramic or ceramic with a
9 thermal conductivity of at most 2 W/(m•K), and the contact
10 fields are composed of sintered AgPd or AgPt thick-layer
11 conductor paste with Pd or Pt proportions between 1 and 10
12 mass%.

1 8. The heating element defined in claim 1 wherein the
2 heating element has a cross sectional area of $3.5 \times 10^{-10} \text{ m}^2$ to
3 $7.0 \times 10^{-10} \text{ m}^2$, the resistance layer is composed of a sintered
4 Ag/Pd resistance paste or a sintered Ag/Au/Pd resistance paste
5 containing 30 to 50 mass% Ag and 35 to 50 mass % Pd, or a
6 sintered Pt/W resistance paste containing 70 to 90 mass %% Pt
7 and 5 to 20 mass% W, the base body is composed of a high-
8 temperature-resistant glass or glass-ceramic or ceramic with a
9 thermal conductivity of at most 3 W/(m•K) and a heat barrier is
10 applied to said base body which is comprised of a glass or
11 glass-ceramic layer of a thickness of 20 to 80 μm and a thermal
12 conductivity of at most 1.5 W/(m•K), and the contact fields are
13 composed of sintered AgPd or AgPt thick-layer conductor paste
14 with Pd or Pt proportions between 1 and 10 mass%.

1 9. A method of making a heating element for igniting
2 a pyrotechnic charge, comprising the steps of:

3 depositing a glass or glass ceramic on a base body to
4 form a glass or glass ceramic layer;

5 applying to said glass or glass ceramic layer a
6 resistance layer in the shape of a strip;

7 structuring said resistance layer with a programmable
8 layer; and

9 applying to ends of said resistance layer respective
10 contact fields enabling electrical excitation of the resulting
11 heating element, said heating element having a mass of 1.0×10^{-9}
12 kg to 4.0×10^{-9} kg, a specific resistance of $1 \times 10^{-6} \Omega m$ to $2 \times 10^{-6} \Omega m$
13 and a specific heat capacity of 100 W/(kg.K) to 400 W/(kg.K).

1 10. The method defined in claim 9 wherein said layer
2 of glass or glass ceramic is applied to said base body by screen
3 printing, is dried and sintered and these steps are repeated
4 until said layer has a thickness ensuring the recited mass,
5 specific resistance and heat capacity for said heating element.

1 11. The method defined in claim 10 wherein the
2 resistance layer is produced by screen printing on said layer of
3 glass or glass ceramic, followed by drying and sintering.

1 12. The method defined in claim 11 wherein said
2 contact fields are applied by screen printing conductive paste
3 overlappingly on said resistance layer, drying said conductive
4 tape and sintering said conductive tape.

1 13. The method defined in claim 12 wherein after
2 sintering of at least one of said layers or after structuring of
3 said resistance layer by said layer, said heating element is
4 subjected to an after-sintering at 800°C to 900°C peak
5 temperature for 10 to 20 minutes to stabilize said heating
6 element against high electrical and thermal loads.